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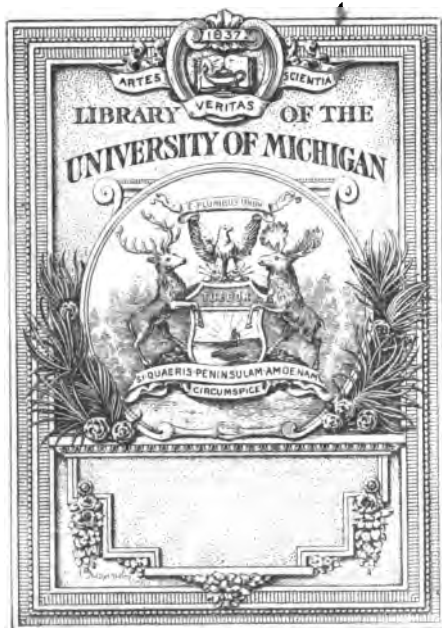
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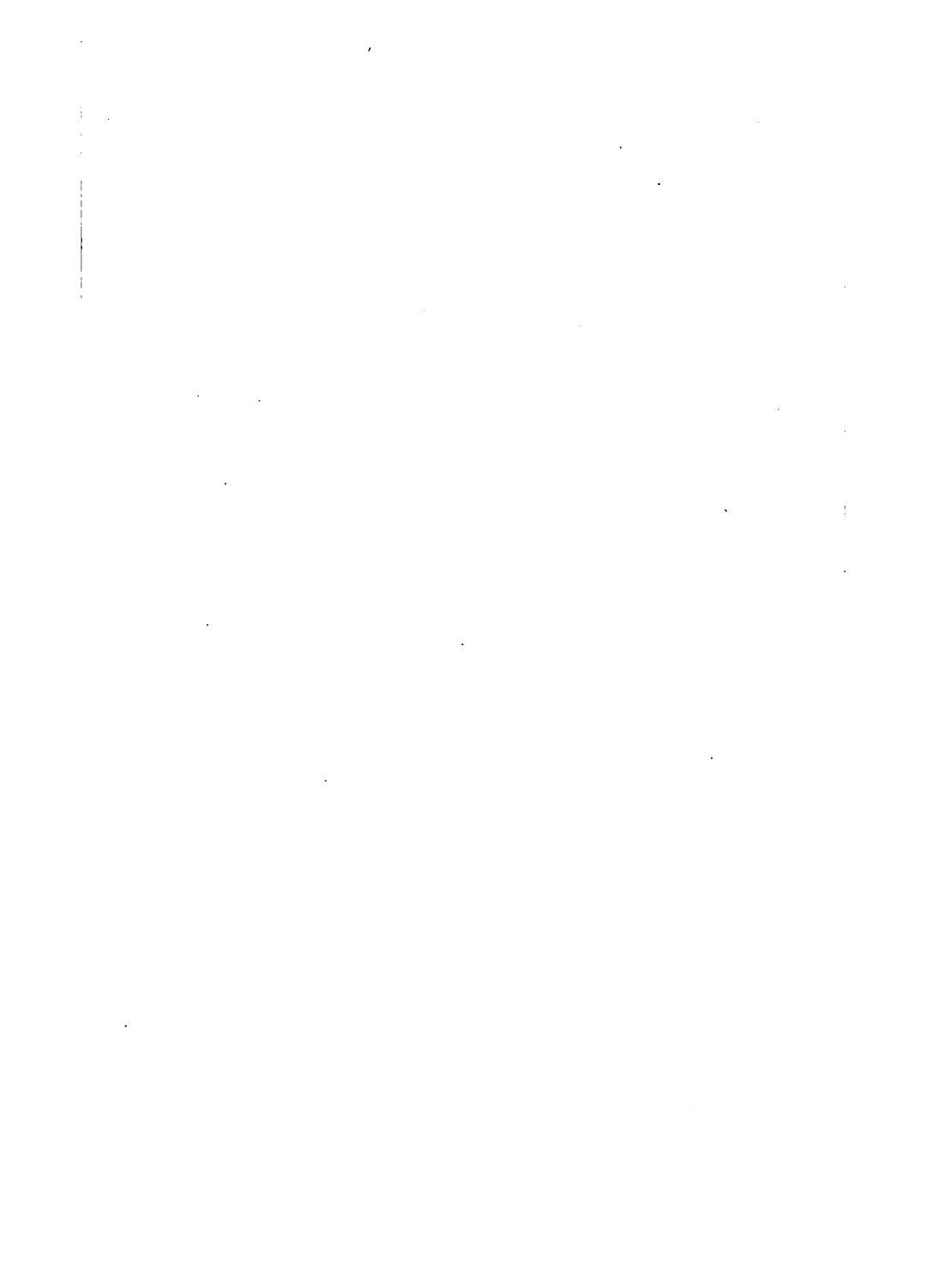
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OPERATIONS UPON THE SEA

A STUDY

BY

FREIHERR VON EDELSHEIM

**IN THE SERVICE OF THE GERMAN GENERAL
STAFF IN 1901**

TRANSLATED FROM THE GERMAN

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FOREWORD

THIS book is of especial importance at this time, for if Germany is to reach the degree of advantage which her military preparedness seemed to prophesy, it is plain that her navy must become increasingly active, and play a far different rôle than that it has assumed in the early stages of the war.

Covering this phase of the German operations the present volume must appeal as forecasting movements strictly within the bounds of actuality. A literal translation is all that has been attempted, with absolutely no embellishment to make it "popular" or easy reading. With characteristic bluntness this German officer brushes aside non-essentials and goes to the main point in daring fashion. For

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that very reason it is exceedingly pertinent to present-day discussions.

Issued as a military study in Germany, semi-official in nature, to characterize it mildly, the material herein published for the first time in English reveals the theories of at least a portion of the military arm of the German Government, which it is only fair to state may not represent the convictions of the German people.

Americans, as neutral but extremely interested observers of happenings of the moment, cannot be blamed, however, for making note of revelations that may come from either side in the conflict. Beyond that, there are evidences on every hand that the patriotic citizens of this country are waking to the necessity to face more securely the difficulties a peace-loving nation may meet because of its lack of enthusiasm for war.

THE PUBLISHERS.

PREFACE

THE purpose of this book is to estimate the value of operation over the sea as demonstrated in modern warfare, to point out the most important factors in its accomplishment, to describe the powerful expedients provided by Germany for such an enterprise, and to broaden the sphere of studying these important questions of interest to our Fatherland.

THE AUTHOR.

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OPERATIONS UPON THE SEA

INTRODUCTION

WITHIN recent years we have had a closer view of operations over the sea in connection with wars on land. The war between Japan and China, between America and Spain, between England and the Transvaal, and finally the Chinese Expedition, have largely demonstrated the methods of transporting troops over the sea. Whilst Moltke has shown the insignificance of the land forces for such operations, the military authorities must in the future reckon on the important problem of preparing for and conducting a war across the sea.

Germany has greater resources for enterprises of this kind, and is more efficient, than any other country. The excellent

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training and readiness for war, the rapidity with which the troops can be mobilized, are not attained by any other power; then, too, Germany has the second largest merchant marine in the world, which affords a first-class transport fleet not surpassed even by England's. Finally, the constant improvement and strengthening of our battle fleet affords additional security in transporting troops. These especially favorable factors make possible a wide field for Germany's activity in world politics. It is feasible for us to build strong military forces which will be of great use to the Empire in this direction, to secure by fighting a feared and esteemed position in the world such as we have attained in Europe.

In this connection, it must be admitted that our navy cannot in the near future reach the degree of development where it would be in a position alone to solve for us

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the problems arising from energetic participation in world politics. This shows the advisability of impressing distant countries that believe themselves inaccessible to direct attack and that have hitherto held Germany in little respect, with the size and strength of our army. That is why we must keep in mind the land operations in expeditions over-sea.

These operations, through their extent and aims, are concerned with the most vital interests of the various nations, and include small enterprises which would serve to acquire commanding positions for war as well as for colonial requirements. All, however, emphasize the problems of transporting, which vary with the conditions of wars on land and which make distinct demands for preparation. These newly found difficulties should be carefully examined by Germany.

!

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I. PRINCIPLES OF OPERATIONS OVER THE SEA

SINCE steamers have supplanted sailing ships for commercial intercourse it is possible to transport our large troop forces in them; but fixed plans should be formulated with the view of making use of these strong and numerous vessels in over-seas operations. The main difficulty arises in the fact that all sea and land fighting forces must be combined. However, any consequent friction can easily be avoided if the army and fleet, in time of peace, become familiar with their mutual dependence and with the need of individual cooperation. It is plain, therefore, that operations over the sea should be planned for in advance. There is no prospect of

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success unless the parts of the complicated mechanism are individually prepared.

The selection of a favorable time and situation for operations is an important factor in its success. If an unexpected landing could be made the opponents would not succeed in making a strong defense, nor would they be able to concentrate sufficient forces to oppose the invasion. Hence the preparation of the land operations must be so thoroughly advanced that in case of war the rapidity of mobilizing and transporting would assure an advantageous surprise. How difficult and costly this task is has been demonstrated by the United States in its expedition to Cuba and by England in transporting its first troops to South Africa.

The object of the operation must by all means be concealed and the preliminary preparations should be planned so as to delude the opponents. Napoleon's ex-

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pedition against Egypt and the manner in which it was undertaken even to-day remains a standard example.

A landing operation on an enemy's shore is generally possible only where one is superior in naval strength to that which the enemy can muster at a critical time. After a landing a victory at sea by our opponents would not be of benefit to them, in case they have not provided sufficient land fighting forces successfully to combat the invasion. Therefore, it is imperative at least to strengthen our German battle fleet so greatly that it would assure the troops a safe passage, and also defeat or hold in check that portion of the enemy's naval forces which they could readily employ.

If the transports sail ahead of the fleet there is the possibility that with a reverse at sea the landing operations could not be carried through. The rule to be followed

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is to employ for operations over the sea all available battleships, part in the regular fleet and part as an escort for the protection of the transports. In no case should the land forces be transported on battleships, for they would restrict the fighting value of the ships. So, for example, the French admiral Gauthaunce—1801—in spite of his superior battle fleet was compelled to withdraw to Toulon before the English fleet because his ships had suffered in fighting value through the presence of land troops.

Only the largest steamships are to be considered for transports because they have a greater field for action, can carry more troops and require a smaller escort of battleships, thereby giving a small battle fleet like ours more available strength, which is, of course, of great value.

Naturally, the ships should be loaded to

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a capacity in proportion to the length of the voyage. In cases where the distance is not great the transport ships can make the trip twice, but it is important that the principal part of the expedition go in the first transports so as not to land an inefficient force on the enemy's coast. The whole purpose of the enterprise might be defeated through lack of aggressive strength of the landing troops. The number of troops to be landed must be greater than the estimated number of the enemy. As they must be able to assume the offensive, it is desirable that the militia be debarred and only well drilled forces, under experienced officers, be sent over. Such a combination gives the required fighting value.

In spite of the difficulty experienced in transporting horses, the cavalry is an extremely valuable adjunct in operations of invasion, playing a great part in offensive

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movements and in assisting the field and heavy artillery. The cavalry will also be able to prevent an attack on the infantry, which might otherwise inflict damage hard to retrieve. In the Crimean War Marshal St. Arnault was hindered in the pursuit of the routed Russians because of the deficiency in the cavalry and artillery in the French army. He had only one hundred troopers at his disposal, and his guns, drawn by only four horses, were greatly hampered in their movements.

The difficulties in transporting large cavalry and artillery divisions can be overcome through modern methods. The extent of our merchant marine makes it possible to forward the necessary number of troops, but it must be remembered that on account of our present political position we can send only as strong a force as we can afford to dispense with at home, without endangering the country.

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The management of the complete operation over the sea as a rule can be better executed by an army officer than by a naval officer, for the success of the enterprise depends principally on the land operations. This leadership would usually fall to the commanding officer of the transport fleet and escorting squadron. It is out of the question to change commands at such a critical period as disembarking. With us the commander-in-chief of the transport troops is lower in rank than the commander of the escorting squadron, a designation which the vicissitudes of war have found very disadvantageous. More than one well-planned operation has been restrained by the commanding admiral because he sacrificed favorable conditions from the standpoint of land operations to gain a slight advantage from a naval standpoint. On the other hand, Napoleon I, against the advice

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of his admirals, disembarked his troops in Egypt, and thereby kept them from sharing the fate of the fleet.

After successful landings it may be necessary to place the transport fleet and its escort in command of the chief of the land troops. Even the battle fleet should be under his direction when a change of base is necessary or when the land and sea forces are in joint action. For technical naval questions the chief command would be assigned to an officer of the Admiral Staff. In a joint attack on a coast city the advantage of harmony and cooperation is readily seen. In the battle on the Alma this fact was demonstrated, the striking of the fleet on the flank was not ordered by the commander of the land forces and was not brought about in unison with the land attack.

II. ACCOMPLISHMENT OF SEA TRANSPORTATION

PREPARATIONS DURING PEACE.

WHETHER the operations be large or small, full preparations must be made during peace. These preparations include first of all the drawing up of plans through the study of political and military relations. Then the operations can be carried out under international jurisdiction, avoiding thereby any disturbances of importance. The possibilities of friction must be given careful thought.

First of all, a base for prospective operations must be determined by exhaustive investigations as to landings that may be suitable. While the first inquiries are made by naval officers, they can only be completed by army officers. The follow-

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ing essential points must be kept in view in searches made by naval officers:

I. To determine the naval strength required for protection of the transport fleet and to settle the question of communication with home ports.

II. To decide upon proper and specific points on the respective coasts, from a marine standpoint.

III. To investigate all harbor facilities for the disembarking of the troops, and to ascertain the number and size of ships the harbor will admit so as to insure the protection of the land and sea flank.

IV. To study the enemy's coast defenses and decide upon the strength required to attack them.

The researches of the army officers concern principally the following:

I. The aim of the operations is to overcome the obstacles as reported by the naval officers.

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II. The number of troops which the opponents can muster against the invasion should be estimated.

III. All questions as to climate, water supply, and equipment necessary should be decided.

All this information has been shown to be of distinct value, and perhaps would cause us to alter, within the next year, the disposition of the line of battle in case of war. Through a well ordered intelligence department definite plans can be made.

Regarding operations which require troops fitted for tropical service, capable officers and forces should be reviewed and inspected during times of peace and made note of accordingly. The division would make a suitable unit for large operations and could be formed from different army corps. These divisions should be so equipped that they could operate independently in customary situations.

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Fuller preparations should be made for the sending of heavy artillery, the telegraph and airship divisions. These formations would be important problems during the voyage at sea. An especially skilled staff is needed. To this end, loading transports and landing maneuvers for the heavy artillery and other heavy divisions should take place annually in suitable harbors on coasts that present the right opportunities for the troops. An enlarged command of officers and subordinate officers would show sufficient strength in a relatively short time. Incidentally it might be possible to have these maneuvers take place in our foreign possessions, where we could better determine the actual needs of operations of this sort. This training would bring forth the simplest and best means for the adjustment of our merchant marine for transporting troops. All other expedients for the voy-

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age would likewise be shown. Some of this needed experience has already been acquired through our expedition to China.

Just as a detailed plan of mobilization is required for any war on land, a complete plan is necessary for operations over the sea which embraces also the railway trip to the harbor and the rapid execution of the tasks involved in embarking. On account of limited facilities only one division can be handled on a railroad. The necessity for transfer by wagons to the ships requires enlarged railway stations and piers in many places. Furthermore, many different supply depots must be built and maintained. In these depots building material should be held in reserve for the alterations that are needed for the transformation of the merchant ships into transports. All other apparatus for successful transporting, such as extra lifting

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contrivances, flat-bottom boats, gang planks, and so forth, should be stored in advance. Usually, these adjuncts are lacking in the merchant marine. Light railroad rolling stock for use in the tropics or in difficult land conditions is also recommended.

In addition to these supply depots there must be in all harbors large warehouses containing clothing, food and coal. The small requirements of our transport to China did not emphasize sufficiently the value of advance preparations, but it is evident that within a few days over one hundred steamers should be provided with such accommodations. To do this in an emergency would require too much time aside from the difficulty that might be encountered in securing skilled labor.

For long distance transportation our large harbors on the North and East seas

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can be utilized equally well for embarkation. Speed is the chief requisite. In order to lessen the distance of transporting, operations toward the west must be conducted from the North Sea ports and toward the east from our east sea ports. This does not preclude the possibility of towing the transports from the east sea through the Kaiser Wilhelm Canal to the North Sea should it be found desirable, but it would involve a waste of time. The smaller harbors should not be used for embarking for large enterprises because they lack the necessary facilities. They might be utilized to advantage in a smaller way, provided sufficient means were at hand to take care of one division a day. Especially suitable harbors on the North Sea are Emden, Wilhelmshaven and Bremerhaven, in connection with Bremen, and Cuxhaven with Hamburg and Glückstadt. These are the harbors that should have

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complete preparations made for possible expeditions.

Bremerhaven is by far the best. In every respect it would take first place for embarkation, because of its extensive wharfs. From this point two or more divisions could be shipped daily without difficulty. Cuxhaven is not so well situated, but its connection with Hamburg is important. If it were brought up to full development it could take care of two divisions a day which Hamburg could well supply. Glückstadt is an especially important base because most of our live stock exporting business is carried on there. It is recommended that a short double-track railroad be built from Elmshorn to Glückstadt, making a connection with the reserve corps frontier. In Glückstadt one infantry division and part of a cavalry division can be shipped.

In Wilhelmshaven all the essential fea-

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tures are at hand, but it is doubtful whether, in view of simultaneous mobilization of the fleet, this place can be chosen for the embarkation of land troops. In any event, it would be necessary to enlarge the harbor buildings. The railroad facilities would also have to be increased.

While Emden is favorably situated, an examination discloses many drawbacks. It needs better dock facilities and railroads to bring it up to standard and in order to relieve the extensive shipping of troops at Wilhelmshaven. Under existing circumstances Leer and Papenburg could be used for transporting purposes, and these two with Emden could handle one division.

The situation on the Baltic Sea is peculiarly unfavorable, no harbor, with the exception of Kiel, being deep enough to accommodate our larger steamships. At Danzig the dredging of navigable

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waters and extension of docks should be planned, which are of great importance from a military standpoint. The other smaller ports on the Baltic are at present not suitable for transporting troops.

The Kiel harbor could not be utilized for the loading of large transports because of the same conditions that affect Wilhelms-haven, namely, the delay that might hinder the rapid mobilizing of the fleet, which would not be permitted. The docks at Kiel must therefore be greatly enlarged so that they could thoroughly satisfy simultaneously the demands of the battle and transport fleets. Pillau and Swinemünde should be authorized to extend their very small docks. On the other hand, the large dry docks in Danzig, Stettin and Kiel should be in a position, within the shortest possible time, to provide the necessary buildings for transporting, if the ma-

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terials and warehouses are planned correctly.

Of the greatest importance in operations over the sea is the provision of the proper number of ships. Defects in preparations in time of peace would hinder successful execution and would give the enemy time to take the necessary precautions to oppose an invasion. Yet it should be stated that England, at the outbreak of the Boer, although lacking full preparation during peace, in the course of a few weeks procured the required number of ships for the first shipment.

The problem of ship control would at best fall to the loading commission, which should be settled upon as an established authority to make a comprehensive survey and appraise the German steamers for military transporting. This commis-

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sion should also list the foreign-owned steamers which might be available in the harbors for use in emergencies. Through close commercial relations this control can be extended to neighboring foreign ports (Amsterdam, Rotterdam, Copenhagen) to the end that we might charter several large foreign steamers.

The construction of stables for horses on our commercial ships would cause delay, as we have pointed out previously. It would seem advantageous to have our subsidized steamship companies to build several ships which can be quickly adjusted for shipping horses. This ought to be an easy matter with ships used for shipping cattle. The Hamburg-American Line, it is known, will readily provide such a ship.

The management of the transport depots and the training of the dry-dock and harbor personnel would obviously fall to

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the loading commission. In a similar way, the navy would be permitted to divide the sea-fighting strength, in the event of mobilization, into a fleet of warships and an escort for the transport fleet, assuring effective protection and a fighting force equal in rank to the enemy.

PREPARATIONS AT THE OUTBREAK OF WAR.

Actual preparations for war cannot be kept secret for any length of time. Opponents would receive information through secret channels, which would give them opportunity to concentrate and equip their forces. The immediate preparations before the outbreak of war dare not be instituted generally, but as soon as the decision for operations is conceived, they must be promptly inaugurated. The aim should be to keep the opponents in uncertainty for a short time, and then a rapidly executed operation

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would take them unawares. An unexpected attack depends largely upon rapidity of movement. Incidentally, diplomatic pressure should be avoided if possible because such friction would lessen considerably the chances for a successful undertaking.

In connection with wars on land the preliminary preparations are simplified, for under these circumstances most of the battleships and troops have been equipped and prepared for action. The methods to be employed by the battleships to carry out the operations would vary and must be left to the discretion of the chosen naval expert. It should be pointed out in this connection, however, that with a small battle fleet like ours it is most necessary to concentrate our full strength for the defense and execution of the land operations. We must endeavor, therefore, in time of peace to get our fleet forces out of

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foreign waters and keep the battle fleet together. Thus the great political questions would be decided only upon the European scene.

A rapid mobilization of our sea fighting forces, namely, those which belong to the battle fleet, is of great advantage, but the calling in from foreign waters of such forces would undoubtedly serve to create suspicion. The Kaiser Wilhelm Canal affords us the means to concentrate these forces quickly as may be required either in the North or Baltic Sea.

If the demands for ships and supplies exceed our advance preparations, proper methods should be employed to seize quickly what is needed and immediate reparation made. Plans should also be made to secure sufficient reinforcements of troops. In large operations where all our ships are employed, after they are successfully loaded and started on the voyage

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the transports arriving from foreign waters can be equipped. All ships belonging to hostile nations that are lying in our harbors we would of course seize and utilize for transports.

While the distribution of our transport steamers at the various points of embarkation will have been taken care of by the loading commission, various difficulties would be encountered in altering the vessels that by chance are at the disposal of the commission for transports, such as unforeseen defects and inaccurate measurements of the foreign chartered steamers arriving in our ports. The adjustment and equipment of these ships must be expedited so that the troops can be despatched in masses as fast as they arrive. Once the ships reach the selected harbors the necessary rearrangements probably can be made simultaneously with the loading, depending upon the advance prepara-

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tions and the presence of a skilled staff of workmen. The time needed will depend somewhat upon the length of the voyage to be made.

In England the steamers for transporting troops to Cape Town, which is a long trip, were prepared in four days for the infantry and in seven days for the cavalry and artillery. The consuming of such time, even for a long sea voyage, must be considered poor execution. At the time of our expedition to China we had the ships complete in a short time. For one steamer, the discharge of the cargo, readjustment for transport and reloading, with the exception of the cavalry, not more than two days need be consumed. For short distances, according to English and Russian estimates, one day is required for infantry and two to two and one-half days for cavalry and artillery. These periods can be greatly shortened through the

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efficiency of the building staff, as pointed out previously.

The formation of the expedition corps must of course be established in the annual maneuvers. Various factors, such as seasons, political aims, present situation of opponents, extent of material for the available ships, all bear witness to the urgency of taking up measures in advance for facilitating the work of mobilization. The speedy concentration of troops and materials at the points of embarkation will make heavy demands upon the railroads, even though the haul is short, and the shipment comparatively small. Arrangements should therefore be made with the railroads to have on hand at all times sufficient rolling stock for these purposes, to guarantee the prompt departure of the transports. It is urged that authority be given the loading commission to supervise and direct this work. It must be taken

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into consideration that part of the troops are inexperienced reserves and good order must be maintained. A high standard of efficiency should prevail, to lessen the burdens of executing orders.

Numerous machine gun divisions increase the fighting strength and do not require great space or support. The usefulness of a cyclist division depends entirely upon the condition of the roads in the hostile country. For the reasons stated previously, cavalry would not suffer in distribution of strength, which is customary in wars on land. In large over-seas operations it is recommended that a special cavalry division or brigade be formed for reconnoitering purposes. Beyond this, the strength of the cavalry division must be sufficient to render possible an independent operation. It would also be of great value to the field artillery, of which an ample supply is on hand.

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Especially important is the method of distributing supply trains, for these require a great deal of space and render landing very difficult. They also hinder the rapid movement of the expedition corps. When the transports do not remain in close communication with the troops after landing, a very large supply of stores is necessary to make the army independent of the vessels. There should be added, therefore, a reserve ammunition column to that already provided.

A fixed amount of supplies should be determined upon, taking due consideration of the extent of the voyage. The troops could requisition some materials from the hostile country.

EMBARKATION.

Proper loading is the business of the land forces and should be conducted by trained officers so as to ensure the ship-

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ment of materials and men. To make landing effective the necessary supplies should go on the vessels with the troops. A loading plan should be so drawn up in advance as to meet all emergencies. The length of time consumed for loading depends on the distance of the voyage.

At the most the limit of a short sea voyage for us has been considered about forty-eight hours. This is too small an estimate; it should undoubtedly be doubled. The Italian General Staff estimates the length of a short sea voyage to be five days. Besides, to preserve the fighting worth of our troops, we must allow sufficient time for rest.

The troop transport capacity of a ship has heretofore been calculated by the ship's tonnage, that is, sixty per cent. of the ship's capacity is net ton loading space. The necessary space for us, for a long sea voyage, is set at two tons for each

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man and six to seven tons for each horse. The English and Russian estimates are about the same. But the English transports to Cape Town accommodated a larger number of troops than was thought possible, and the American transports to Cuba were increased by one-third.

As for the arrangements which must be made for sleeping, cooking and washing and for a hospital service, we need not go any further here, as they have been discussed at length in the press. The stowing of equipment and baggage should be done in such a way as to make the articles available on landing in the order in which they are needed. The ship's space required for maintenance supplies for man and horse figures relatively as about one to five.

Coming next to the loading of the artillery, the rule should be to place all common and machine guns on deck. A

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certain amount of ammunition should be stowed so as to be quickly accessible. This is an essential measure to afford the transport protection from some privateer. The guns should be securely placed to prevent their movement by the motion of the sea and to render feasible their use on deck. Trials will soon be made to find the suitable means whereby field artillery may be put to successful use on shipboard, and this testing will certainly repay us. All rolling stock will be stowed away firmly in the freight space without removing the wheels. The material and personnel of the field hospital should be divided among the ships, so that a ship's hospital division may be formed. The airship division should be placed on deck in such fashion that observation flights may be made during the voyage.

The shipping of horses is especially difficult. By former methods the horses had

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to stand the entire trip and had practically no exercise. This left them in a weakened condition and made necessary a long rest after arrival. For a war transport, in which is required a rapid and successful offensive, such horses are not useful. Because of the important work to be done by them after landing, careful attention should be given to the horses to keep them in good working condition. To this end, proper nourishment must be given and facilities provided for daily exercise while on the transports, which should consume at least three-quarters of an hour for each horse.

Ships that are built particularly for the transportation of horses can be adjusted with four decks over each other, including upper deck stables and two courses for exercise, so that a transport of from three to four thousand net tons capacity can carry over one thousand horses. Three ships

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would accommodate two cavalry brigades. On every large steamer many horses can be shipped for a long trip, in addition to its regular quota of men and supplies.

After the transports have been prepared, about seven hundred and fifty horses, equal to one cavalry regiment, or six batteries, can be loaded daily on the lower decks. Cleanliness, ventilation and care are the three most important factors for the good health of the horses. Every horse transport must be given ventilating apparatus to assure sufficient fresh air. Artificial ventilation is to be preferred to natural ventilation, for if the latter becomes too strong the horses' lungs are easily affected. Through this cause, for example, the American transport to Cuba lost the greater number of their horses.

Likewise condensers are required for the necessary quantities of drinking water. It is recommended that each ship be given

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its own condenser. The provision of only one or two large condensers on special ships which supply the entire demand of the transport fleet, as the Americans employed in their expedition to Cuba, has not proved practical.

For the short sea voyage, our transports would be able to despatch substantially more troops, through Germany's geographical position. The strength of near-by powers requires, though, the immediate utilization of all ships and materials at our disposal, if the operations are to succeed. For short expeditions, the general rule will be to ship as many troops as the transports will carry. The forces will bivouac on the upper and lower decks and receive only straw bags and covers. They will keep their whole baggage with them. Cooking will be done in large field kettles. If time permits, it is recommended that the same adjustments as for

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a long journey be made for the horses, at least to provide separate stalls. This will prevent heavy losses in case of rough weather. Guns and accessories can be disposed of in the same manner as for long voyages.

The length of time for embarkation depends on whether the loading can be done from the wharves of the harbors or whether the troops and materials must be taken out by lighters and then transferred to the ships. The latter method is a waste of time and is dependent on wind and weather.

The time required for loading is as follows: Fifteen minutes for one hundred men, one minute for one horse, ten minutes for a cannon. In an operation by the Russians, 8,000 men, including infantry and cavalry, were embarked in eight hours. In our loading of East Asia transports, it required one to one and one-half

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hours to load one battalion. The speed of our loading has amazed departmental circles in general. It is certain, though, that this time can be greatly reduced through detailed preparation and training. Napoleon I, in the year 1795, had ostensibly drilled his troops so well that he could plan to put 132,000 men and their materials on shipboard in two hours.

It must be remembered that everything, troops, guns and supplies must eventually be landed on open coasts. Portable flat-bottom boats and building materials for piers must therefore be carried on the transports. Special vessels must accompany the transport fleet with large reserve supplies of food, equipment, ammunition, coal and so forth. A cable-laying ship is also required.

We must now consider to what extent Germany is able to load forces for the execution of operations which involve only

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a short voyage, in which success depends so much on speed. For embarkation on the North Sea, Hamburg and Bremen alone could furnish so many steamers capable of being converted into transports, that with their tonnage capacity the loading of four infantry divisions is possible in a period of four days. With the addition of ships from Emden, Wilhelmshaven, Glückstadt and Kiel we would be able to despatch in the same length of time, at least six infantry divisions, or five infantry and one cavalry division. To these must be added several especially large and fast German steamers, partly for the shipment that might be delayed and partly to expedite the return to home waters. A large number of troops can also be shipped from Baltic ports. Besides this, a repeated trip of the transport fleet is possible if the command of the sea is maintained continuously.

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For longer sea voyages, in which the importance of speed is not so great, our transport fleet can be greatly increased through chartering or purchasing ships of foreign nations. Still, we are at present in the position to despatch about four infantry divisions, with present available ships, within ten or twelve days.

SEA VOYAGE.

For transporting troops over the sea, it is the chief problem of the navy to clear the course to the hostile shore. All enterprises of this kind are dependent on the battle fleet, whose first aim, therefore, must be to run down and attack the enemy's fleet which the transports might encounter; if the opportunity is afforded our fleet must bring about an engagement for the command of the sea at least by the time of embarkation. As the mobilizing of the battle ships is finished before the

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transport fleet is ready to put to sea, they can undertake an early offensive to make secure the passage of the expedition. Also, throughout the voyage offensive operations can be undertaken by the battle fleet, in waters distant from the transport, which would serve the same ends of keeping the course clear.

The escorts of the transport squadron should consist of just enough ships to give immediate protection. A large number would increase unnecessarily the size of the transport fleet without increasing its safety, while every addition of strength to the battle fleet is of the greatest value. The task of the escorts is only to protect the transports from attacks by single or several small vessels of the enemy. Our torpedo boats are particularly adapted for escort service, and make it feasible to restrict the number of large battle ships used for this purpose. During the assem-

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bling of the transports, these boats may devote themselves to secure the safety of the traffic between the loading harbors.

The departure of the transports from the various harbors must be so regulated that they sail in close union, to assure a safe voyage and a quick landing. The loading commission must take appropriate means to expedite the loading in those harbors farthest removed from the central assembling points. As a rule, the transport steamers would sail with the battle fleet; but in the English expedition to South Africa and ours to East Asia, this rule was not followed.

An essential requirement is that the transports put to sea as soon as the loading is complete. They cannot wait for news of the success of the battle fleet. A certain risk is involved, but it is not great, for the transport fleet can always turn back. Only an early departure would in-

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sure successful, unexpected landing. The shorter the voyage the greater the necessity for a surprise attack.

In the event of our battle fleet being attacked, it does not follow that the transport operations must be abandoned, for if the voyage be short an energetic continuation of the venture will command a fair prospect of success. Even the victor in a great naval battle might not be able to carry out an attack against the transport squadron. An individual hostile battle ship or cruiser would find it difficult to break into the transport fleet.

An important factor in the sea voyage, perhaps the most important, is the weather. For short distances, it is possible to a certain degree to choose favorable weather for the passage, with the help of scientific forecasts. Conditions might be such that a delay would not harm the operations. Adverse weather conditions

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would more seriously affect long-distance transporting, to a degree that might cause abandonment. Our vessels must be so improved as to make them independent of wind and weather, to make certain the speed of the voyage and to permit the establishing of a time record. For the time of the passage, the highest speed of the slowest boat is the standard, which could probably be increased by towing with tugs.

In putting to sea all transport ships must retain the order of position they are to take in the squadron; this order is not broken until after leaving the harbor, so that the object of the voyage is known only to the home officials. The advance guard of troops will sail in the fastest ships so that they can make the unexpected landing. The pioneer and airship divisions are placed with the advance guard. The ships which have artillery

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ride on the flank of the troop transports. Then follow the ships carrying supplies. The cable ship comes last. The laying of the cable gives a continuous communication with the home country. For extensive voyages, preparations must be made for taking on coal on the open sea. The commander-in-chief of the expedition corps should be on a transport steamer so that in event of a fight the transport fleet will not be without proper guidance.

On long sea voyages, gymnastics, drilling and target practise can be pursued. Ample daily exercising of the horses will occupy the greater part of the time of the cavalry. For short sea voyages these features are not so necessary. In general, strict discipline must be exercised to overcome the tediousness of the trip.

While the command of the troops on every transport is in the oldest officer, the command of the ship remains in the hands

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of the captain, who is inferior in rank to the commander of the troops. If this captain has not served in the German navy, a midshipman may be signed as a coordinate officer. It is our policy to provide every transport ship with a naval officer.

LANDING.

Military history shows that an attempt to prevent a really bold landing is never successful. The defense must either scatter its forces along the coast to be protected, or concentrate its full strength to cover one point, while the assailant, through the mobility of its transport, can keep its landing plan uncertain, and under the protection of long-range guns on the ships can throw more troops quickly on the land than the defense is able to concentrate in the same time. A simultaneous landing at different places is

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hazardous if the opponent can muster considerable strength. An expedition is seldom so large that disadvantages arise through landing at one point. On the other hand, it would require a great many battleships for the protection of numerous landing places. A division of the forces weakens all of them, and great difficulty would be found in uniformly managing the start of the operations for want of time and means. Therefore, it is recommended, when the situation permits, to select one central place for landing.

For the disembarking a harbor is of course the most advantageous; less advantageous but always favorable is an enclosed, protected bay; the most unfavorable is the open coast. Yet a landing on the open coast would encounter little resistance if it is carried out with great speed. If the chosen landing place be near a bay or a seaport town, it would be

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the mission of the first landed advance guard to seize this port, to make it possible for the transport fleet to disembark the mass of troops, horses and materials. The occupation of a good harbor will greatly hasten the unloading, prevent a hostile attack from the sea and add greatly to the ability of the landing corps to carry on the operations. If a seizure of a port is not possible, the landing of the entire expedition must take place by means of prepared disembarking contrivances. Every transport must be equipped for landing on an open coast.

The best landing place is a site nearest the object of the operations, which would force the opponents to a decision before they were thoroughly prepared. Clear coast regions within range of the ships' guns are desirable, as is also quiet, deep water near to the landing site.

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It is possible to land within range of important hostile garrisons and fortifications. Russian landing maneuvers have demonstrated the truth of this statement. Fortifications are effective against landing enterprises only when sufficient troops are on hand to defend the coast. If the assailant is successful in landing a detachment of troops out of the range of the fortifications, the latter would be ineffective for defense. The best security, however, for the initial landing is its unexpected delivery. Reconnoitering of the coast site by boats sent beforehand is an absurdity, for the opponents immediately become acquainted with the landing plans and are given time for preparations for defense. Of great importance for rapid, well-regulated landing is uniform management through the signal service of the ships and the telephone service on land,

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which can be installed advantageously. In anchoring the ships must be the correct distance apart, to avoid crowding.

The execution of the landing as a rule is as follows: The advance guard rides ahead, on the last stretch, with its own escort of battleships, and lands, if possible, unawares, usually at night. If the landing be on an open coast, the mass of troops which follow should immediately throw up earthworks. The entire disembarking must be made with great speed, for the quicker the landing is accomplished the less the danger of being disturbed. The most favorable time for attacking the coast is at dawn, for the landing can take place unknown to the enemy and day be used for disembarking. As the ships do not carry a sufficient number of patent boats for landing on an open coast, special flat-bottom boats should be

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prepared for unloading horses and heavy material. The English employ collapsible boats for landing men, which accommodate a crew of fifty, while the Russians have flat-bottom boats capable of holding two hundred men, or one complete cannon. It is recommended that we be permitted to try the Russian model, which has been well tested. Small power boats should be employed for tugging, as rowing would be a waste of valuable time. To permit horses to swim ashore is to be condemned, for it would cause confusion and delay, and we know from experience that a large number are sometimes lost. The Americans, in their landing in Cuba, lost seven per cent. of their horses. For the landing of artillery and heavy materials small landing bridges must be erected on the beach, for which prepared material is carried on the transports. The assembling of the troops

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must not be permitted on the beach, for all space there must be kept for the landing of supplies.

If a landing near a harbor is successful, the advance guard will strive to take the same unawares, to seize those coast sentinels at hand and to destroy the telegraph and signal service along the coast. If all this is successful, the transport fleet will be signaled to draw near. The advantage is apparent in landing in a large harbor or bay, which affords the possibility of protection from a sea attack, through the mining of the waters or through the guard of a limited number of battleships. Earthworks, equipped with cannon and machine guns, must be thrown up for the protection from the land side.

The piers must be distributed to make sufficient room for disembarking. The existing plans for improvising landing bridges and gangways should be extended,

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in order to expedite the landing. The piers and bridges will be used for ships carrying horses, artillery and heavy materials, while the infantry land by boats, under the protection of large guns on shore or of the escorting battleships, should the battle fleet maintain command of the sea. The landed troops should be supplied provisions for many days so that they can begin operations independent of the supply trains.

The time required for landing is considerably less than for loading. The natural desire of the troops to land quickly helps to shorten the time. One writer gives the following data: Lord Cochran landed 18,000 men on the open coast of America in five hours; in the Crimean War the English accomplished the disembarking of 45,000 men, 83 guns and about 100 horses in less than eleven hours. The French are slower on account of their

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handling of supply trains. The Russians, in their landing maneuvers in the Black Sea, have landed a slow division in eleven and one-half hours, where the steamers had to anchor five to six kilometers from the coast. The marine writer Degories figures that under average conditions it is possible to land 25,000 infantry, 1,000 cavalry and 60 guns in six hours. If the landing can be made in a harbor, this time can be essentially lessened.

After the disembarking of the expedition, the further task of the transport fleet and its escort of battleships depends on the maritime strength of the country attacked. If the assailant continues in command of the sea, the transport fleet can remain as a floating base for the landed corps and can effect the reenforcement of the expedition. If the assailant is not in command of the sea, then the transport fleet must attempt to evade the

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operations of the hostile fleet, by an immediate retreat to home waters.

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The operations of the landed expedition corps on the whole can be conducted according to the principles set down by the commanders of the troops, but these principles must take into account the particular conditions under which the forces operate. The well-known marine writer, Mahan, emphasizes the fact that a landing operation must be offensive to succeed. Military history shows that after boldly carried out landings at Abukir and Cape Breton, for example, the success of the extensive operations was impaired, almost lost, because of lack of energy and rapidity of execution of offensive movements. The assembled strength must be thrown forward on the line of least resistance. Defensive strategy should be used only

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when a delay is necessary to receive expected reenforcements. The primary aim of the operations is to dispose of hostile forces, within the shortest possible time and with the least loss to ourselves.

During the progress of the operations the country through which the troops pass can be drawn upon to supplement equipment and supplies, but the speed of the advance and the efficiency of the troops must not be decreased through extended raids. While the distance to the objective of the invasion is generally not great, it should be our endeavor to be independent of our base of supplies. Much progress has been made in the methods of making condensed foods, for man and horse, which will help to solve the problem of provisions. The army of invasion can also take an important site in the hostile country and utilize it as a base of operations. Continuous communication with the home country is

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therefore not absolutely necessary. In a densely populated and rich country it is easy to secure provisions and supplies. The maintenance of long lines of communications is hazardous in that it requires excessive guard duty. When the battle fleet has gained command of the sea it will be in a position to protect continuously the base on the coast, and would also make it possible for the corps of invasion to select new bases. Sherman's march to Savannah in the Civil War has shown the practicability of this plan. After one objective has been attained, it should be possible for the expedition to reembark to land at some other point on the coast for further operations.

Against the enemy's defenses we must throw our full strength and avoid enterprises that involve a delay or a weakening of our forces. Dearly purchased victories will in the end defeat our own aims.

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If the operations of the troops are carried on along the coast, or if the objective of the operations is a harbor or a coast fortification, the battle fleet should act in unison with the land forces. Battleships are superior to the field artillery, as they can be moved at will and so are hard to put out of action. Continuous bombardment from the battleships would prove effective aid for the troops.

It is important, then, that the command of land and naval forces be joined in a commander-in-chief who would direct the field forces as well as the naval forces. Small coast defenses of seaport cities could not for any length of time withstand such a combined attack. It is certain also that present-day coast defenses could not withstand an energetic attack from the land side. They are more vulnerable than inland fortresses because they are open to attack simultaneously from land and

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water. However, if the battle fleet cannot gain the command of the sea, and must retreat before the opposing forces, the operations of the landed troops must be conducted wholly as a war on land.

REEMBARKATION.

A reembarkation of the expedition corps is possible only when the battle fleet is able to prevent attack from the sea. In the event of defeat on land, reembarkation is not absolutely impossible, for if good order is maintained the improvised defenses of the landing sites, with the help of the fleet, will sufficiently delay the pursuers. If the reembarking must take place from some other point, preparations for its defense must be made in advance. When the reembarkation is done with the aim in view of attacking at another place, the rules as explained in the chapter on "Embarkation" must be adhered to. For

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such an operation, more time is essential, and pressure of the enemy should not be permitted to interfere with its management.

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I. CONSIDERATION OF LANDING OPERATIONS AGAINST POWERS THAT CAN BE REACHED ONLY BY SEA

THE recognized military complication with England and America affords an interesting example on account of the difference in distances in which the transporting of troops takes place, on account of the strength of the sea and land fighting forces of the two opponents, and lastly on account of the difference in the territorial extensions of the aforesaid countries, and on the whole challenges various measures.

A conflict with England must be fixed in the eye of Germany, for the great German struggle for commerce represents to England just as great a danger as the ad-

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vance of Russia against India. Beginning operations with a naval war with England, we could almost foresee the result.

England has brought about the existence of such a powerful, active navy that we, with the best defenses we have, would hardly be able to win a decisive victory. Only by closing an alliance with Russia would the strength of England be injured indeed, but never by a direct threat from these provinces. But an alliance with France would in fact menace England. The latter, however, through her geographical location and through her large and timely expenditures, which every combined operation demands, could make possible by proper equipment a maritime superiority against this alliance.

England's weakness is in just that which forms our strength, namely, the land army. The English army responds

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to neither quantity nor quality of its great and powerful position in comparison with the extent of the land; therefore England, from convictions, proceeds so that every invasion of the land can be prevented by the fleet. These convictions are in no way justified, for while England in developing a powerful sea-fighting strength has every day prepared for war, she has not had a view of the consequences of confronting and beating a really weaker sea opponent with its fighting units.

These are the measures which Germany, in case of a threatened war with England, must adopt and practise: Our endeavors must be to engage the fleet, if possible; to throw part of our land forces upon the English coast, so that the conflict on the sea can be carried to the enemy's land, where our troops are already superior in quality to England's, and so that a victory for England's powerful naval

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strength could have but the smallest influence.

The army fighting strength of England under the commander-in-chief is composed of the army reserve, the militia, the volunteers and the yeomanry. In the event of an unexpected invasion, only the commander-in-chief and army reserve can be considered to any extent, for the militia needs so much time to assemble and equip that they would be in a weak position to assist the commander-in-chief in the first decisive battle. The volunteers and yeomanry cannot in so short a time be trained for war or be mobilized for action. Also their insignificant fighting value must be kept in view, beside which our well-trained troops will not let them seem as menacing opponents.

The English army is formed of three army corps with three divisions to each corps. A third to a half of these corps is

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comprised of militia, so that either it must be first completed, and then it would be too late for cooperation in the first decisive battle, or it would be so untrained that it really cannot be said to reach the strength of a division. Of two army corps, two divisions and one cavalry brigade are in Ireland, the greater part of which must remain there to prevent the undertaking of a German invasion through Ireland even though it brought about the longed-for freedom.

The preparation for defense should also be considered. This might consist of one army corps with three divisions, or one army corps comprised of two divisions, with perhaps a cavalry brigade made up from three army corps. Whereas the army strength of an English division is about 10,000 men, a German division carries 16,000 men, hence four German divisions and a cavalry division would have

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a superiority over the English army. But we are in a position to set over in England, in the shortest time, six divisions of infantry, or five divisions of infantry and one cavalry division.

How a well regulated operation against England is to be conducted across the sea, obviously cannot be forecasted here. The passage in moderate weather is a little over thirty hours' ride from our North Sea harbors. The English coast affords extensive stretches of shore which are suitable for landing troops. The land contains such large resources that the invading army can procure a living therefrom. On the other hand, the extent of the island is not so great that the English land defenses could ever succeed in timely destroying a successful invading force.

It is improbable that Germany could carry on for very long a well regulated

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war necessitating considerable reenforcement of troops. The supplies would have to be furnished for the greater part on land. Maintaining communication with the home country can therefore readily be seen to be of importance.

It is conclusive that the first aim of every operation of invasion in England is their field army, and the second must be London. It is probable that these two objectives would fall together, in that the field army, on account of the small value of the volunteers, is needed for the protection of London fortifications, so as not to leave the metropolis insufficiently defended. Powerful public opinion would demand this for fear that London would fall into the hands of the invaders. But if London is taken by the invading army this would still be only one of the many war ports which must be seized, to secure

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a base of supplies and for the further operations which have every view to concluding the overthrow of England.

Operations against the United States of North America must be entirely different. With that country, in particular, political friction, manifest in commercial aims, has not been lacking in recent years, and has, until now, been removed chiefly through acquiescence on our part. However, as this submission has its limit, the question arises as to what means we can develop to carry out our purpose with force, in order to combat the encroachment of the United States upon our interests. Our main factor here is our fleet. Our battle fleet has every prospect of victoriously defeating the forces of the United States, widely dispersed over the two oceans. It is certain that after the defeat of the United States fleet, the great extension of unprotected coast line and

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powerful resources of that country would compel them to make peace.

There is no effective method to force this opponent to relinquish its maritime operations, even though there is only a trifling number of American merchantmen, except the simultaneous blockading with our sea forces of American ports, which can only be taken with heavy losses, while our fleet demonstrated the actual limited worth of the unpacified American colonies.

It must be deemed a possibility that the battle fleet of the United States would not risk an engagement at sea except to avoid a disaster, but would await, in its fortified harbors, a favorable opportunity to strike. It is evident, then, that a naval war against the United States cannot be carried on with success without at the same time inaugurating action on land. Because of the great extensions of the

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United States it would not be satisfactory for the operation of an invading army to be directed toward conquering the interior of the land. It is almost a certainty, however, that a victorious assault on the Atlantic coast, tying up the importing and exporting business of the whole country, would bring about such an annoying situation that the government would be willing to treat for peace.

If the German invading force were equipped and ready for transporting the moment the battle fleet is despatched, under average conditions these corps can begin operations on American soil within at least four weeks. To what extent we will be able to succeed has already been considered.

The United States at this time is not in a position to oppose our troops with an army of equal rank. Its regular army actually totals 65,000 men, of whom not

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more than 30,000 are ready to defend the home country. Of these at least 10,000 men are required to guard Indian territory and for the garrisoning of coast-wise fortifications, so that only a regular army of 20,000 is available for field service. There is also a militia of 100,000 men, the larger number of whom have not been trained since the last war summons, and they are poorly equipped with inferior rifles and still more poorly drilled.

If an unexpected invasion of the United States is prevented by the length of time for the transporting of troops, and only an unexpected landing can take place, it must be emphasized that the weakness and inexperience of their regular army would essentially facilitate a quick invasion.

For the continued occupation of as large a territory as the United States, if they can oppose us for any length of time,

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an important fighting force will be necessary, to protect the operating lines and to carry on a successful warfare. An invading operation will be difficult to reenforce, in that a second trip of the transport fleet will be required, in order to despatch the necessary number of troops, at such a great distance.

It is upon the whole questionable whether there is anything to be gained in occupying for any length of time so large a stretch of land as the United States. The fact that one or two of her provinces are occupied by the invaders would not alone move the Americans to sue for peace. To accomplish this end the invaders would have to inflict real material damage by injuring the whole country through the successful seizure of many of the Atlantic seaports in which the threads of the entire wealth of the nation meet. It should be so managed that a line of

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land operations would be in close juncture with the fleet, through which we would be in a position to seize, within a short time, many of these important and rich cities, to interrupt their means of supply, disorganize all governmental affairs, assume control of all useful buildings, confiscate all war and transport supplies, and lastly, to impose heavy indemnities. For enterprises of this sort small land forces would answer our purpose, for it would be unwise for the American garrisons to attempt an attack.

Their excellently developed net of railways will enable them to concentrate their troops in a relatively short time at the various recognized landing points on the coast. But there are many other splendid landings, and it appears feasible for the invading corps to conduct its operations on these points with the cooperation of the fleet. The land corps can either ad-

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vance aggressively against the concentrated opposing forces, or through embarking evade an attack and land at a new place.

As a matter of fact, Germany is the only great power which is in a position to conquer the United States. England could of course carry out a successful attack on the sea, but she would not be prepared to protect her Canadian provinces, with which the Americans could compensate themselves for a total or crushing defeat on the sea. None of the other great powers can provide the necessary transport fleet to attempt an invasion.

II. VIEWS ON COLONIAL EXPEDITIONS

ALL operations for colonial expeditions can be undertaken successfully because of the small forces necessary to transport over the sea to make war upon a country which does not possess modern equipment and trained troops. Just such an expedition was unostentatiously carried out in China before our own eyes.

The sending of an expedition to East Asia affords an interesting example of what can be done. Without resistance we have set up governments at a distance from the home country. It is possible with the aid of the fleet to secure similar results. However, there are many obstacles to be overcome. It is imperative that in time of peace we should prepare

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in every possible way for war in foreign lands which have any commercial value for us. Inasmuch as the German army has determined upon larger divisions of troops, the problems of operations on the distant sea falls to the navy. In the future the conducting of such operations will rest with the General Staff. It will be necessary to continue the preparations, described fully in the forepart of this book, for the carrying out of operations against such countries as Asia, Africa and South America. Good judgment must be used in the selection of methods. The execution of the first operations would require the constantly combined efforts of the General Staff and the Admiral Staff.

Our excellent knowledge of East Asia has given us the necessary technical preparation in the way of equipment. The chartering of transport ships for service

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to China should not be difficult in consequence of the large size of the expedition. The expedition corps would require eighteen ships, material and supplies would take five. The greater part of this number would be amply supplied by our two large steamship companies, the North German Lloyd and the Hamburg-American Line. The charter of these steamship companies provides for their use as transports if needed for expeditions of this sort. The disadvantages of this arrangement once appeared in the delay through a labor strike, when it was necessary to transport part of the unfinished ships to Wilhelmshaven. Another drawback is that not enough room is provided in these ships. On the steamers of the Hamburg-American Line, for example, only sixty-five per cent. of their normal passenger capacity can be utilized for troops which means at the most an

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approximate displacement of three net tons, so that only one man instead of two can be carried. An adjustment should be reached to the end that the entire freight capacity of the steamers could be counted upon.

The interior arrangements of a steamer to be used for troop transport must be planned according to law. Fire-extinguishers, life-saving apparatus and other necessities must be provided for; numerous tables and benches which can be drawn up to the ceiling should be in the troops rooms, and should also be found up on deck. Hospital arrangements for two and one-half per cent. of the transport strength should be provided.

The active troops of the expedition corps are at present drawn from volunteers, the reserve and the militia, and grouped in new formations. Through this the home defenses may be benefited, but

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the expedition corps would not be up to standard, even though the newly formed troops would have sufficient time to concentrate. It is advisable for such an expedition to employ active, well-trained soldiers for the main part, while the balance could be made up of reserves. It is also to be recommended that in the near future we form a fixed body of troops trained for hospital service. Such a formation would have great intrinsic worth.

A few words should be said about the organizing of a Colonial army, which would be called upon to play an essential part in German military operations over the sea. It would be of extraordinary value in preserving order in our colonies and would also be of assistance in commercial aims. The Colonial army would constitute a picked body of men, suitable for service in hot climates and uncivilized

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countries, who would be able to fight effectively against colonies with which we might be at war.

There would still remain, however, the need of preparation of our home forces for colonial expeditions. We are not assured at present of the assembling of the necessary number of qualified troops without drawing on our regular army.

It requires a good deal of time to procure the equipment for an expedition to East Asia. Therefore, contracts with capable firms should be made, to make delivery in the shortest possible time.

While the equipment of the infantry with up-to-date weapons is easily accomplished, it is noteworthy that only about thirty horses can be loaded by the English system. Some effort should be made to solve the horse problem. The purchasing of horses in Australia, America and South China has ceased, in consequence of the

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knowledge that only a small percentage can withstand the change of climate.

It would be impossible to employ joint cavalry forces, due to lack of mounts. It is imperative to find the means for forming a mounted infantry, for there is an insufficient number of advanced cavalry troops to meet an emergency. It would be advantageous if large brigades now idle could be moved for operations in Eastern China. Past experience in China has emphasized the great importance of cavalry for operations in large countries.

The losses in newly purchased horses would be greater than if we would send trained horses accustomed to military service. The great loss in transporting horses is no longer to be feared. The experience of the English in transporting horses to Cape Town proves the worth of their loading system. And it should be pointed out that the Prussian horses,

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through their training, can endure climatic changes and the hardships of sea transportation much better than the English horses.

The thirty horses on the transport must be well taken care of to reach East Asia. The ships should be fitted out with this aim in view. Accidents usually occur in crossing the equator. The Red Sea and the Indian Ocean are especially difficult to cross. This could be overcome by sending the transport by way of Cape Town, where a part of the trip could be made south through the Tropic of Cancer. It has been demonstrated that horses not older than from ten to sixteen years should be selected for service abroad. No fear need be felt as to the feeding of the horses, for our horses are accustomed to little corn. Sometimes feedings of soaked rice with molasses added have given favorable results.

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A possible help for the outfitting of the artillery would be the purchasing in Italy of native mules and loading them at Genoa. In English sea-transporting these animals have demonstrated their exceptional powers of resistance. They are preferable to horses because they can endure hardships better and can more easily be accustomed to conditions in East Asia.

While we have a large variety of artillery, our expedition corps must be equipped with mountain guns which can be carried by beasts of burden. This is often necessary in colonial expeditions. Experience shows that it is difficult to move the heavy artillery of the field army over bad roads, and the large guns would not get very far. This is true also of the steel-boat bridge trains. It is surprising that our collapsible boats, universally approved as superior, are not utilized.

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Our military arrangements have not included a suitable hospital service, because the ambulances are too heavy and unwieldy. The French seem to have been afforded very good service by the so-called cacolets—saddle horses with pack saddles for the sick and wounded. These are excellent for use in colonial countries. A light wagon model is generally recommended for supplies, for despite the condition of the roads they must be able to follow the troops.

It is a question how the unfavorable conditions of communication with our men-of-war can be improved. Once the forces and supplies are in Bremen and Bremerhaven no difficulties would be found in embarking. For the future a central place is recommended from which the expedition corps can sail.

If thorough preparations are made the loading of the transports can be accom-

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plished in two or three days; by the old method of loading it took two days for each ship. To facilitate the work, the loading should be done simultaneously on both sides of the steamer. The greater part of the supplies can be brought by tugs from Bremen to Bremerhaven. The troops can consequently embark at Quai in about four hours. The vessels, which have been arranged to utilize all available space, can also carry all accouterments, ammunition and supplies. Great delay and inconvenience might be caused by not accurately calculating the massive proportions of the military shipment. It is therefore above all argument that the military authorities and not the steamship company should oversee the loading so that it would be done properly from a military standpoint. Through a haphazard loading, the detached troops might not go in the same boat with their belongings,

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and they might not even know where their individual effects were stowed. Disembarking would be difficult and delayed, causing the forces to wait a long time for the unloading of their guns and ammunition.

With regard to the sea voyage, it is very advantageous for us that the sailing of the joint fleet is not required. The trip by transport would take from forty-two to fifty-seven days. The trip from Shanghai to Taku can be made successfully with the aid of our battle fleet. The transports should sail without artillery equipment, so that no difficulty would be experienced in getting letters-of-marque; but if they could have on deck even a small amount of the guns which they have on board, they would have nothing to fear from privateers or auxiliary cruisers. Upon arrival at Taku, considerable difficulties might be encountered, for it is re-

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ported that it is practically impossible to procure the extra help needed.

Considering a landing at Tsingtau, it should be noted that there has not been provided a sufficient number of disembarking boats. This situation proves that under all circumstances the troop transport must be equipped independently to land its troops and supplies.

Experience has taught us that a great deal of preparation is necessary to undertake colonial expeditions and it behooves us now to lay a foundation for future operations over the sea.

III. CONCLUDING VIEWS

MANY operations of our army, under protection of the fleet, can be conducted in hitherto unexpected directions; many commands which our fleet may not be able to carry out alone can be accomplished by the combination of the land and sea forces. Now if the army across the sea is able to resist our strength, it is necessary to prepare in advance to have our battle fleet so strong that it will be in a position to assist materially in any undertaking of our troops. From studies of the strength of our various opponents across the sea whom we must aim at, because their neighboring territory is of great importance to us, it is plain that we must enlarge our fleet to protect our commercial interests.

